Soccer Lineup

Tactics are hard. During the recent EM soccer tournament, Lea met "Ragnar O. S. Fußballsson", the coach of the small national team of Fireland. Fireland is a small island somewhere in the ocean with fewer inhabitants than sheep. Thus, it is hard to establish a very good national soccer team. Nevertheless, its inhabitants are very proud and always fight back against the bigger countries and its coach naturally comes up with brilliant tactical plans on how to beat the other team.

Lea got to talk to him for a while and he elaborated on his tactics: Famous soccer tactics include the $3-4-3$ (3 defenders, 4 midfielders and 3 strikers) or the $4-3-3$ (4 defenders, 3 midfielders and 3 strikers) or some other elaborate placement of team members.

The players also wear numbered shirts with numbers from 1 to 11 and for every firelandic inhabitant it is perfectly clear that two players can never play in the same position if the sum of the numbers of their shirts is 13. Otherwise the team is doomed and will surely lose. Thus, valid soccer lineup assigns a position to every player, has exactly one goalkeeper and the shirt numbers of no two players in the same position sum up to 13. While Ragnar rambles on, Lea cannot help but marvel how many different soccer tactics there could be and began dreaming about the infamous $6-2-2$ that, in her imagination, would beat all the agressive teams. Can you tell her how many possible soccer lineups there are for a given team?

Input

The first line of the input contains an integer t. t test cases follow, each separated by a blank line.

Each test case consists of exactly 11 lines, each describing a single player: The i-th line describes the player with shirt number i (numbered from 1 to 11) and contains a string s_i that describes the possible positions player i can play. s_i then contains a character c if player i can play on position c. Position characters are either G (Goalkeeper), D (Defender), M (Midfielder) or S (Striker).

Output

For each test case, print a line containing "Case #i: x" where i is its number, starting at 1 and x is the amount of valid soccer lineups. Each line of the output should end with a line break.

Constraints

- $1 \le t \le 20$

- s_i consists only of the characters "G", "D", "M", "S".

- s_i contains every character at most once.

- s_i contains at least one character.

Sample Input 1	Sample Output 1
3	Case #1: 1
G	Case #2: 0
D	Case #3: 8
D	
D	
D	
D	
M	
M	
S	
S	
S	
GS	
D	
D	
D	
D	
M	
M	
M	
MS	
S	
S	
G	
D	
D	
D	
D	
M	
MS	
MS	
MS	
MS	
S	

Sample Input 2

```
5
GM
DM
DSG
GSM
S
S
SGD
GM
D
D
DGM

SD
MSD
MD
DG
D
SGD
S
GS
MSD
GSM
DGS

GS
D
SDG
SD
SD
MD
M
GS
DM
MS
S

DS
DSG
MSD
GS
SDM
MG
MGD
SDM
MG
DM
M

D
MDS
SMD
GDM
G
SDG
MGS
SGD
GDS
SD
S
```

Sample Output 2

```
Case #1: 22
Case #2: 236
Case #3: 33
Case #4: 528
Case #5: 144
```